

### **AMENDMENTS TO THE CLAIMS**

Please amend claims 1 and 20. Claims 5, 13, 14, 17, and 18 were canceled in previous papers. The following listing of claims will replace all prior versions and listings of claims in the application.

1. **(Currently Amended)** A cathode head suitable for use in an x-ray device and the cathode head comprising:
  - an emitter block;
  - an emitter attached to the emitter block and configured to generate electrons of an electron beam, at least a portion of the emitter being positioned within the emitter block, and
  - at least one magnetic element that defines an opening within which a portion of the emitter is positioned.
2. **(Original)** The cathode head as recited in claim 1, wherein the at least one magnetic element comprises at least one electromagnet.
3. **(Original)** The cathode head as recited in claim 1, wherein the at least one magnetic element comprises at least one permanent magnet.
4. **(Original)** The cathode head as recited in claim 1, wherein the emitter block is substantially non-magnetic.
5. **(Canceled)**
6. **(Previously Presented)** The cathode head as recited in claim 1, wherein the emitter defines a longitudinal axis which extends through the opening defined by the at least one magnetic element.
7. **(Previously Presented)** The cathode head as recited in claim 1, wherein the at least one magnetic element comprises a pair of electromagnets, each of which defines an opening within which a respective portion of the emitter is positioned.

8. **(Original)** The cathode head as recited in claim 1, wherein the at least one magnetic element and the emitter block cooperate to create a magnetic field through which at least a portion of the electron beam passes.

9. **(Original)** The cathode head as recited in claim 1, wherein the emitter comprises at least one filament.

10. **(Previously Presented)** A cathode head suitable for use in an x-ray device and comprising:

a magnetic emitter block;

an emitter attached to the emitter block and configured to generate electrons for an electron beam that defines a focal spot; and

means for facilitating focal spot control, wherein the means generates a magnetic field with a magnetic flux density  $B$  having flux lines that are substantially perpendicular to a direction of travel of the electron beam.

11. **(Previously Presented)** The cathode head as recited in claim 10, wherein the means for facilitating focal spot control serves to adjust a position of the focal spot.

12. **(Previously Presented)** The cathode head as recited in claim 10, wherein the means for facilitating focal spot control enables at least lateral adjustments to a position of the focal spot.

13-14. **(Canceled)**

15. **(Original)** The cathode head as recited in claim 10, wherein the means for facilitating focal spot control implements an adjustable deflection of the electron beam.

16. **(Original)** The cathode head as recited in claim 10, wherein the means for facilitating focal spot control acts on the electron beam in a location proximate the emitter.

17-18. **(Canceled)**

19. **(Original)** The cathode head as recited in claim 10, wherein the means for facilitating focal spot control cooperates with the emitter block to create a magnetic field through which at least a portion of the electron beam passes.

20. **(Currently Amended)** An x-ray device, comprising:

a vacuum enclosure;

an anode substantially disposed within the vacuum enclosure, the anode including a target surface; and

a cathode head ~~substantially~~ comprising the following elements, each of which is substantially disposed within the vacuum enclosure ~~and comprising~~:

an emitter block;

an emitter attached to the emitter block and configured to emit electrons of an electron beam that defines a focal spot on the target surface of the anode; and

at least one magnetic element that defines an opening within which a portion of the emitter is positioned.

21. **(Previously Presented)** The x-ray device as recited in claim 20, wherein the at least one magnetic element comprises a pair of magnets, each of which defines an opening within which a respective portion of the emitter is positioned.

22. **(Original)** The x-ray device as recited in claim 20, wherein the at least one magnetic element comprises a permanent magnet.

23. **(Original)** The x-ray device as recited in claim 20, wherein the emitter block is substantially non-magnetic.

24. **(Original)** The x-ray device as recited in claim 20, wherein the emitter block is magnetic.

25. **(Previously Presented)** The x-ray device as recited in claim 20, wherein the emitter defines a longitudinal axis which extends through the opening defined by the at least one magnetic element.

26. **(Original)** The x-ray device as recited in claim 20, wherein the at least one magnetic element and the emitter block cooperate to create a magnetic field through which at least a portion of the electron beam passes.

27. **(Original)** The x-ray device as recited in claim 20, wherein the anode is a rotating anode.

28. **(Original)** The x-ray device as recited in claim 20, wherein the anode is a stationary anode.

29. **(Previously Presented)** A cathode head suitable for use in an x-ray device and comprising:

an emitter block;

a filament attached to the emitter block and defining a longitudinal axis, the filament being configured to emit electrons of an electron beam; and

first and second magnetic elements that define respective openings within which the emitter block is positioned.

30. **(Original)** The cathode head as recited in claim 29, wherein the emitter block is substantially non-magnetic.

31. **(Original)** The cathode head as recited in claim 29, wherein the emitter block is magnetic.

32. **(Previously Presented)** The cathode head as recited in claim 29, wherein at least one of the magnetic elements comprises an electromagnet.

33. **(Previously Presented)** The cathode head as recited in claim 1, wherein the at least one magnetic element is arranged such that flux lines of a magnetic flux density B of a magnetic field associated with the at least one magnetic element are substantially perpendicular to a direction of travel of an electron beam generated by the emitter.

34. **(Previously Presented)** The x-ray device as recited in claim 20, wherein the at least one magnetic element is arranged such that flux lines of a magnetic flux density  $B$  of a magnetic field associated with the at least one magnetic element are substantially perpendicular to a direction of travel of an electron beam generated by the emitter.

35. **(Previously Presented)** The cathode head as recited in claim 29, wherein a portion of the filament is positioned within one of the openings respectively defined by the magnetic elements.

36. **(Previously Presented)** The cathode head as recited in claim 29, wherein flux lines of a magnetic flux density  $B$  of a magnetic field associated with at least one of the magnetic elements are substantially perpendicular to a direction of travel of the electron beam.

37. **(Previously Presented)** The cathode head as recited in claim 29, wherein the emitter block substantially comprises ceramic.

38. **(Previously Presented)** The cathode head as recited in claim 29, wherein at least one of the magnetic elements comprises a permanent magnet.

39. **(Previously Presented)** The cathode head as recited in claim 29, wherein the first and second magnetic elements are disposed in a spaced apart arrangement with respect to each other.

40. **(Previously Presented)** A cathode head suitable for use in an x-ray, the cathode head comprising:

a magnetic emitter block;

an emitter attached to the magnetic emitter block; and

at least one magnetic element arranged such that flux lines of a magnetic flux density  $B$  of a magnetic field associated with the at least one magnetic element are substantially perpendicular to a direction of travel of the electron beam.